CENTERLINE RUMBLE STRIPS

The Delaware Experience

Introduction

Centerline rumble strips are an effective safety tool used to address head-on and fixed object accidents occurring on two-lane rural roadways resulting from motorists crossing the centerline. This type of accident typically occurs as a result of driver inattention, driver error, and fatigue. The desired results from centerline rumble strips are the vibrations and noise produced to alert drivers that they are crossing the centerline. To address a recurring accident problem identified on U.S. 301 involving head-on accidents and community pressures to construct a new four-lane roadway, the Department of Transportation installed centerline rumble strips along the 2.9 mile section of U.S. 301 from the northern limit of the City of Middletown to just south of SR 896 (see Figure 1).

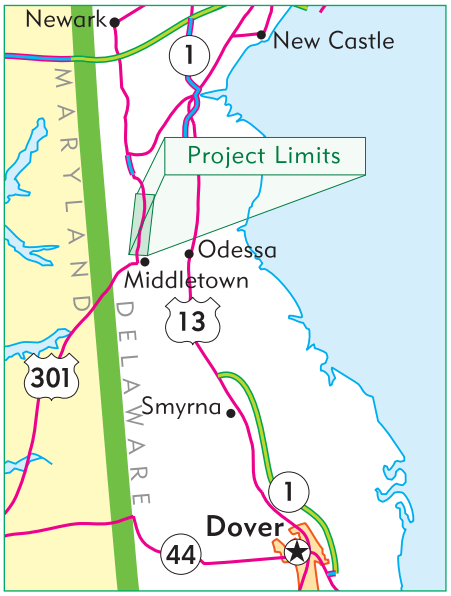

Figure 1

Accidents – Before and After Study

A before and after accident study was performed to determine the effectiveness of the installation of centerline rumble strips on U.S. 301. Average yearly accidents during the three-year period before installation were compared to average yearly accidents during the seven-year period after installation. During the "before" period, six fatal accidents were reported, resulting in nine fatalities. All were the result of head-on collisions.

BEFORE - AFTER ACCIDENT SUMMARY

Accident Type	Average Number of Accidents Per Year		
	Before Period 8/91-7/94 (3 years)	After Period 12/94-11/02 (8 years)	Percent Change
Head on	2/year	0.1/year	-95%
Drove Left of Center	2/year	0.8/year	-60%
Property Damage	6.3/year	7.1/year	+13%
Injury	4.7/year	4.9/year	+4%
Fatal	2/year	0/year	N/A
Total	13/year	12/year	-8%
Average Daily Traffic	16,500 (1994)	22,472 (2002)	+4% yearly

Table 1

As shown in Table 1, although the total number of reported accidents did not decrease significantly, and the number of property damage and injury accidents increased slightly, average yearly head-on collisions decreased by 95 percent after the installation of centerline rumble strips. Accidents caused by motorists crossing the centerline decreased by 55 percent. Most significantly, even with a four percent average yearly increase in traffic volumes, there were no fatal accidents reported during the seven-year period after installation of the centerline rumble strips.

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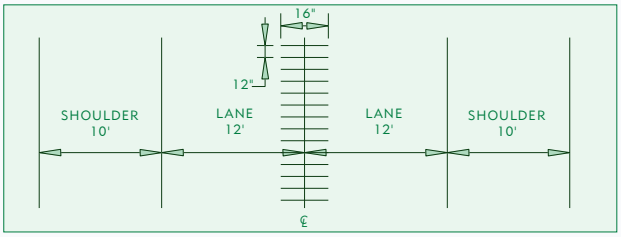
RUMBLE STRIP DETAIL



SECTION A-A

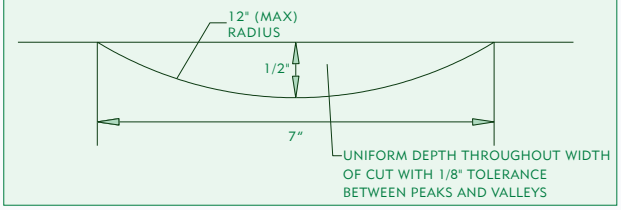


Figure 2

Installation

Installation of milled centerline rumble strips is performed by a machine that has a blade that is programmed to cut the same shape, depth, width, and length into pavement. The impressions are twenty-four inches wide, are spaced twelve inches apart, and are made along the centerline as shown in Figure 2. After the machine has cut the shape, the resulting debris is swept, collected, and discarded. Because the centerline rumble strips are cut into the pavement, they are equally effective on new, existing, or reconstructed pavement.

Benefits and Costs

Over the years, the cost of installing rumble strips has decreased dramatically due to technological advances in installation and widespread applications throughout the country. The cost per linear foot of roadway varies from approximately $0.20 to $0.60 depending on the length of installation (e.g. larger projects result in lower average costs per foot). This cost does not include maintenance of traffic.

ADVANTAGES

- Effective in reducing the number of head-on collisions due to driver inattention, driver error, and fatigue
- Centerline rumble strip installation costs are low
- No noticeable degradation of pavement
- Rumble strips require little or no maintenance
- Milled rumble strips can be installed on new or existing pavements
- Unlike other safety features that decrease in effectiveness over time due to the "novelty" effect, this is not an issue for drowsy drivers

DISADVANTAGES

- The noise produced by rumble strips may be disruptive to nearby residents
- Potentially transferring a head-on collision problem further down the roadway to locations without centerline rumble strips

A benefit-to-cost (B/C) analyses was performed to determine the cost effectiveness of the U.S. 301 centerline rumble strip application. The resulting B/C was approximately 110. Due to low installation and maintenance costs, centerline rumble strips were an effective method of reducing head-on collisions.

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